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The Economics of Consumer Product Information

Rachel Dardis

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National Engineering Laboratory
National Bureau of Standards
U.S. Department of Commerce
Washington, D.C. 20234

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FOREWORD

While considering a program to provide performance information on consumer products, the Department of Commerce and its National Bureau of Standards sought answers to questions such as:

- (1) Are standardized test methods generally available?
- (2) How would performance labeling of products affect manufacturers?
- (3) Would a Government program to provide performance information be accepted and supported by industry?
- (4) To what extent would consumers benefit from such a program?

This study, a review of the relevant literature on the economics of consumer product information, was part of this search.

SUMMARY

Objectives

Interest in consumer information in recent years reflects technological and social changes which have increased the complexity of the consumer decision-making process. The proliferation of products, brands, and models has been accompanied by decreased communication between buyer and seller due to the growth of mass marketing and the emergence of time as a major constraint in consumer information processing. The major objective of this study was to examine the economic principles underlying the acquisition and provision of consumer product information. The analysis should provide an understanding of reasons for information failures in the marketplace and problems faced by policy makers in attempting to correct such failures.

Benefits from Consumer Product Information

The direct benefits from consumer product information include more effective communication of consumer preferences in the marketplace and increased consumption efficiency. In the economic theory of consumer behavior the preferences of the consumer in conjunction with income and market prices determine what goods and services are consumed. Communication of consumer wants in the marketplace, in turn, influences production. If the consumer is uninformed, however, the marketplace no longer communicates consumer wants and the concept of consumer sovereignty is invalidated.

The second direct benefit is the cost savings due to improvements in consumption efficiency. Information concerning product characteristics which can be determined objectively provides a basis for determining the consumer's efficiency frontier of product characteristics. The consumer's subjective preferences for characteristics then determine the particular combination of characteristics and goods selected. Information plays an essential role in locating the efficiency frontier.

The gains from product information are based on the loss in consumer welfare due to the existence of comparable products for different prices or the discrepancy between actual and perceived product characteristics. The greater the disparity between prices of products and between actual and perceived product characteristics, the greater the benefits from product information.

The indirect benefits from product information include the impact of information on market structure and product quality. Consumer ignorance reduces competition based upon price and quality and creates a potential barrier to entry for new firms in view of the importance attached by inexperienced buyers to brand name

and firm reputation. While there are no incentives to improve product quality when the consumers are ignorant, efforts to reduce costs in order to increase the firm's market share and/or profits will frequently lead to lower quality products.

Economics of Information Acquisition

Consumer goods may be classified into two categories--search goods and experience goods. The consumer may obtain information about product performance prior to purchase by searching for and acquiring information or may rely on actual experience with the product during consumption. The search process is likely to be of particular importance in the case of high technology, durable, expensive consumer goods in contrast to inexpensive, frequently purchased goods where the consumer's own past experience is a reliable source of information.

The degree of information acquired by the consumer is a function of perceived costs and benefits including both monetary and non-monetary factors. If the perceived benefits are low due to consumer ignorance of market deficiencies, and the perceived costs are high due to information processing requirements, then the degree of information obtained by the consumer may be relatively low. Failure to use existing information should not, therefore, be attributed to consumer irrationality but rather to the costs of information collection and processing relative to the perceived benefits.

Consumer Information Gap

Three major studies were examined to determine if there had been changes in price-quality relations for durable products over time and whether price-quality relations were affected by product category (9,24,37). All three studies used product ratings data from consumer testing magazines (Consumer Reports and Consumers' Research Magazine), and obtained rank correlation coefficients for product price and quality. Twenty-seven percent of the product tests analyzed in 1960-67 had significant positive price-quality relations compared to 31 percent for the 1970-77 time period. The mean rank correlation coefficients for the two time periods were 0.36 and 0.27. The results of the three studies indicate that 1) markets for consumer goods are functioning imperfectly, 2) market performance has not changed greatly in the past two decades, 3) price-quality relations are characterized by considerable instability within brands and product categories, and 4) price-quality relations for major appliances reflect an absence of search behavior by consumers.

Reasons for Information Failures in the Marketplace

The existence of information failures reflects a variety of technological and social changes within the past decades.

However, the incentives for producers or consumers to close the gap may be lacking. Sellers gain from product differentiation, and product information increases price competition and reduces the market power of established brand names. While advertising provides information, its primary purpose is to sell products, not to facilitate the consumer decision-making process. Consumers face several problems in acquiring and processing information. First comparable objective information on product characteristics and performance for different brands is generally lacking. Second, the costs of information processing are high due to technical requirements and time constraints. Thus, the consumer is likely to rely on other factors such as price and firm size and reputation. However, reliance on the judgment of sellers neglects the fact that such judgments are exercised for the benefit of sellers rather than for buyers. Finally, the consumer may not perceive that he is operating inefficiently since consumption inefficiency is not signaled in the marketplace in a manner similar to production inefficiency. The lack of incentives for buyers and sellers to change their existing behavior patterns means, in turn, a continuation of the consumer information gap.

Solutions to the Problem

Deficiencies with respect to the demand and supply sides of the market and the existence of externalities due to indirect benefits provide justification for developing consumer information programs. Voluntary programs include comparative testing, informative labeling, standards, and quality certification. Each of these programs differs with respect to the degree of information provided, information processing requirements, and consumer choice. Comparative testing differs from other programs in that manufacturers generally are not involved in the selection of relevant product characteristics and identification of appropriate test methods. The other programs involve input from business and industry, consumer organizations, and other private or public organizations.

Mandatory programs are generally used when consumer protection is needed and voluntary programs are likely to be inadequate. Mandatory labeling is more restrictive than voluntary labeling but less restrictive than mandatory standards or product banning. Mandatory standards may provide information but their primary purpose is to protect the consumer. They are frequently advocated in areas of health or safety. In other instances, recognition of the importance of freedom of choice results in acceptance of the consumer's right to be wrong since the alternative of supplying consumers with what they "really need" is both unfeasible and undesirable.

Major issues in the provision of consumer information include: 1) how much information should be provided, 2) what is

the best mechanism for achieving the desired level of information, and 3) the distribution of program costs and benefits. Again the level of information depends on monetary and non-monetary costs and benefits. Criteria such as adequacy, efficiency, and feasibility are important in program assessment and are frequently interrelated. Thus, manufacturers and retailers may be the most efficient providers of information in view of familiarity with product performance and access to customers. However, their information is likely to be inadequate since its primary purpose is to sell products. Feasibility pertains to buyer or seller response which may prevent or decrease the likelihood of success of a particular program. Disinterest on the part of buyers and sellers is a major reason for the failure of information programs. A second, and perhaps more important reason, is the divergence between consumer and producer interests. Some producers gain from consumer ignorance, and the gains accruing to others from the reduction in consumer ignorance are purchased at their expense.

The divergence between consumer and producer interest may be a major reason underlying the consumer information gap. The continuation of this gap affects not only consumer welfare but the economy as a whole. Information is an essential element in the efficient performance of the free market system. Failure to generate adequate information threatens not only the performance of the system but also the system itself since intervention may occur to correct market deficiencies. The divergence between consumer and producer interests is, in part, responsible for the perpetuation of the consumer information gap. While such a divergence may be expected to continue, the information gap may be reduced eventually as both parties recognize their mutual interest in the free market system.

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THE ECONOMICS OF CONSUMER PRODUCT INFORMATION

Rachel Dardis

The major objective of this study was to examine the economic principles underlying the provision and acquisition of consumer product information.* The direct and indirect benefits from product information and the economics of consumer information acquisition comprise the first part of the study. The existence of the consumer information gap within the past two decades is investigated in the second part of the study. Reasons for information failures in the marketplace are then examined leading to a discussion of various methods for increasing the level of consumer product information. The analysis should provide an understanding of reasons for information failures in the marketplace and problems faced by policy makers in attempting to correct market deficiencies.

1. INTRODUCTION

The major objective of this study was to examine the economic principles underlying the provision and acquisition of consumer product information. The increased interest in consumer information in recent years reflects an awareness of changes with respect to product technology, production, distribution, and consumer life styles which have resulted in information failures in the marketplace. Economics can assist in an assessment of this situation in several ways. First, information is a service whose provision and acquisition entails monetary and other costs. Both the costs and benefits of information must be considered, therefore, in determining whether there is an adequate level of information utilization in the marketplace. Second, information plays a major role in ensuring a competitive and efficient market system that is responsive to consumer needs. These indirect benefits pertain to all consumers in contrast to the cost savings achieved by an individual consumer as a result of product information. The effect of such externalities may mean that the current level of information is less than optimal. Finally, the divergent impact of information on producer and consumer interests must be recognized in determining reasons for information failures in the marketplace and in developing appropriate information strategies.

*Readers interested in the economics of information in general are referred to a recent comprehensive review article by Hirshleifer and Riley (14).

2. BENEFITS FROM CONSUMER PRODUCT INFORMATION

Consumer product information yields both direct and indirect benefits. Direct benefits include more effective communication of consumer preferences in the marketplace and increased consumption efficiency. The theory of consumer surplus (or compensating variation in income) may be used to estimate the gains from consumption efficiency. The impact of consumer information on market structure and product quality comprise the indirect benefits.

2.1 Direct Benefits

2.1.1 Communication of Consumer Preferences

According to the economic theory of consumer behavior, the individual possesses a preference function which is maximized subject to the budget constraint. The economic model can be illustrated by considering a simplified model with two goods, X and Y, which the consumer may purchase at prices P_x and P_y . The budget constraint in this instance is given by

$$M = XP_x + YP_y$$

where M is the consumer's income and X and Y refer to quantities of the two goods purchased. In Figure 1, the budget line is given by the line MN. Quantities of X and Y are measured on the horizontal and vertical axes, respectively. As the formula for the budget constraint indicates, the budget line is affected by consumer income and the prices of X and Y. Thus an increase in the price of one good relative to the other will change the slope of the budget line while an increase in money income (prices remaining unchanged) will result in a parallel shift outward of the budget line.

The consumer's preference function is illustrated by a set of indifference curves U_1, U_2, U_3 in Figure 1. Each indifference curve represents a collection of bundles (varying quantities of X and Y) which yield equal levels of satisfaction to the consumer. Higher indifference curves represent higher levels of satisfaction since it is assumed that the consumer prefers more of each good to less. Satisfaction or utility is measured in an ordinal manner which means that, while bundles along U_3 are preferred to bundles along U_2 , the degree to which they are preferred (twice as much, three times as much) is not considered.

Utility maximization subject to the budget constraint results in the consumer purchasing quantities of X and Y given by point E in Figure 1. Point E will remain an equilibrium situation unless prices, income or preferences change.

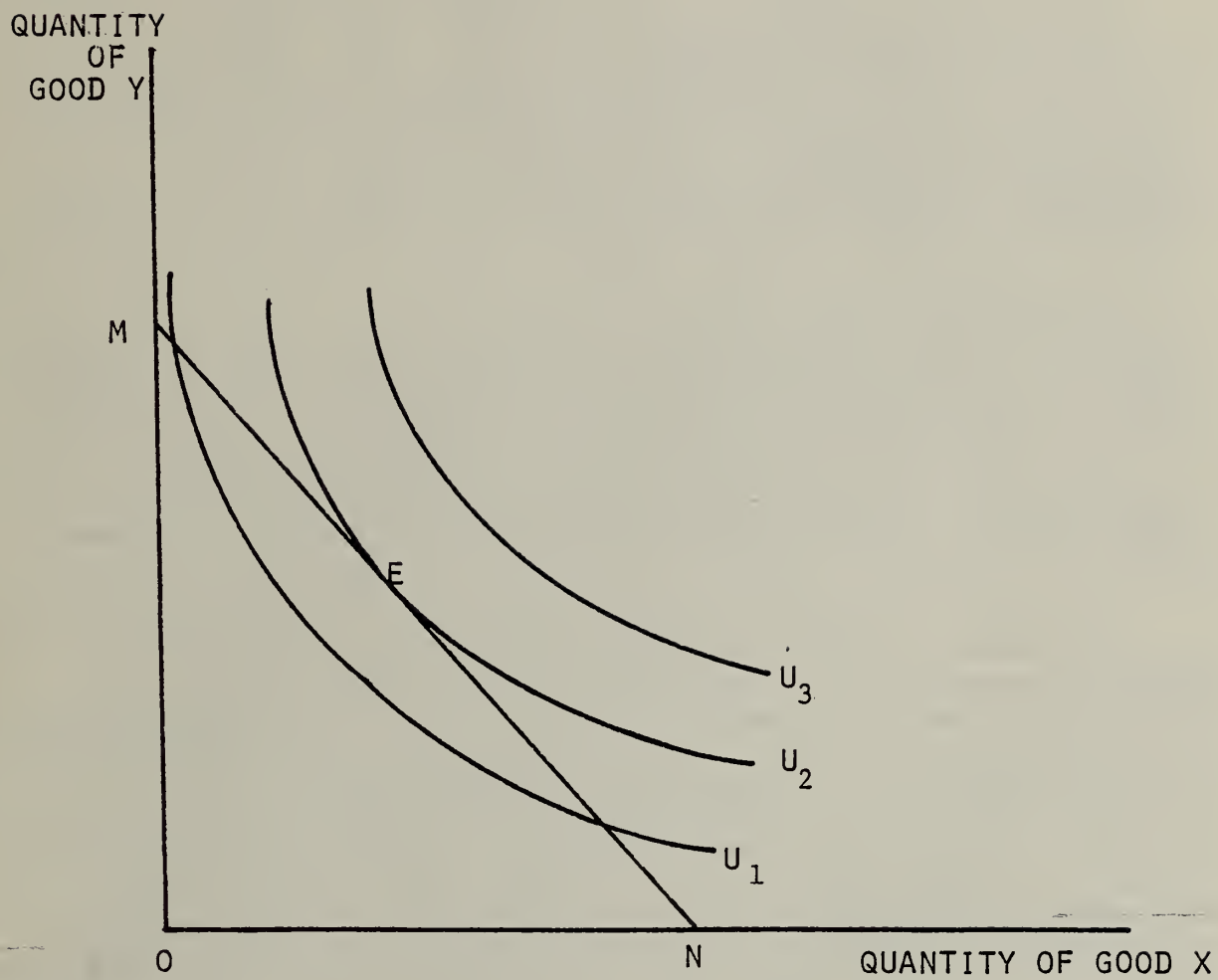


FIGURE 1. UTILITY MAXIMIZATION

Certain assumptions underlying the economic theory of consumer behavior are important:

- 1) prices are known,
- 2) performance characteristics of products are known, and
- 3) the consumer is rational.

Rationality refers to the consumer's ability to rank bundles so that his preferences remain consistent and transitive. Thus, in the case of three bundles A, B, and C, the consumer may prefer A to B, B to A, or be indifferent between A and B. However, only one outcome is possible so that the consumer cannot simultaneously prefer A to B and B to A. This is the consistency assumption. The transitivity assumption means that if A is preferred to B and B is preferred to C then A must be preferred to C.

The economic use of the term "rational" is quite limited and implies no value judgment concerning how a particular consumer allocates his budget. Each consumer (provided he is informed) is deemed to be in the best position to select the particular bundle of goods and services which yields the highest level of satisfaction. Each consumer's preference function is unique so that consumers having identical incomes and paying the same prices may select different quantities of goods and services.

Information plays a crucial rôle in the communication of consumer wants in the marketplace and in the operation of consumer sovereignty. The concept of consumer sovereignty has been summarized by Fulop as follows: "it is the preferences of consumers, as shown by the way in which they spend their money, that determines what merchandise is produced and services supplied" (8, p. 11). The concept of consumer sovereignty has been debated at length and it has been challenged on many grounds, in particular the gap between what consumers really want (consumer preferences) and what they buy due to inadequate information (30,36,44). If the consumer is uninformed then the marketplace can no longer act as a mechanism for communicating consumer preferences, and the concept of consumer sovereignty is invalidated.

2.1.2 Consumption Efficiency

The concept of consumption efficiency was introduced by Lancaster in 1966 (17). According to Lancaster goods are valued for the collection of characteristics that they contain. He assumes that the characteristics possessed by a good or a combination of goods can be determined objectively and are the same for all consumers. Examples of characteristics are proteins and vitamins which may be obtained from a variety of food

products. The utility derived from a set of characteristics is subjective and reflects the individual consumer's preference function. The purchase process may then be separated into two stages. In the first stage the consumer determines the maximum number of characteristics which might be obtained for a certain dollar expenditure. This is called the efficiency frontier.* When the efficiency frontier is combined with the individual's preference function, the combination of characteristics yielding the highest utility is selected.

The Lancaster model can be illustrated by considering a simplified model with three goods, X, Y and Z, each possessing two characteristics A and B (Figure 2). The quantity of each characteristic is measured along the axes while the consumption of goods X, Y, or Z yields a vector of characteristics given by OX, OY, and OZ, respectively. Imposition of a budget constraint yields an efficiency frontier abc where point a reflects the maximum quantities of characteristics that may be obtained when the consumer allocates his total income to good X. Points b and c are derived in a similar manner. The lines joining points a, b, and c reflect a combination of goods X and Y, Y and Z, and X and Z. Given the preference map shown in the diagram the informed consumer will select good Y and attain a level of satisfaction given by U_2 . In the absence of information concerning Y, however, the consumer will operate along line ac selecting a combination of X and Z given by point d. In this instance the consumer is operating within his efficiency frontier and has a lower level of satisfaction as a result.

The Lancaster model may also be used to estimate the impact of product innovation. Thus in the absence of good Y the consumer's efficiency frontier is given by ac. The introduction of Y shifts the efficiency frontier outward. However, unless the consumer is informed of the characteristics of good Y he will remain at point d, within the new efficiency frontier.

Lancaster's approach is valuable in that it highlights the importance of information in the consumer decision process.

*Hendler (13) has raised a major reservation concerning Lancaster's model when the efficiency frontier is derived from a linear combination of goods. He argues that the utility from the consumption of a single good is unlikely to be the same as the utility from a combination of goods even though both processes have the same number of characteristics. Otherwise "the individual is indifferent to whether he consumes one very sweet apple and one without any sweetness (but otherwise identical) or two mildly sweet apples, as long as the sum of sweetness and all other characteristics are the same" (13, p. 198). Hendler concludes that combinations of goods thus provide a "characteristics possibility frontier" rather than an "efficiency frontier" unless the consumer is indifferent to the distribution of characteristics in each good.

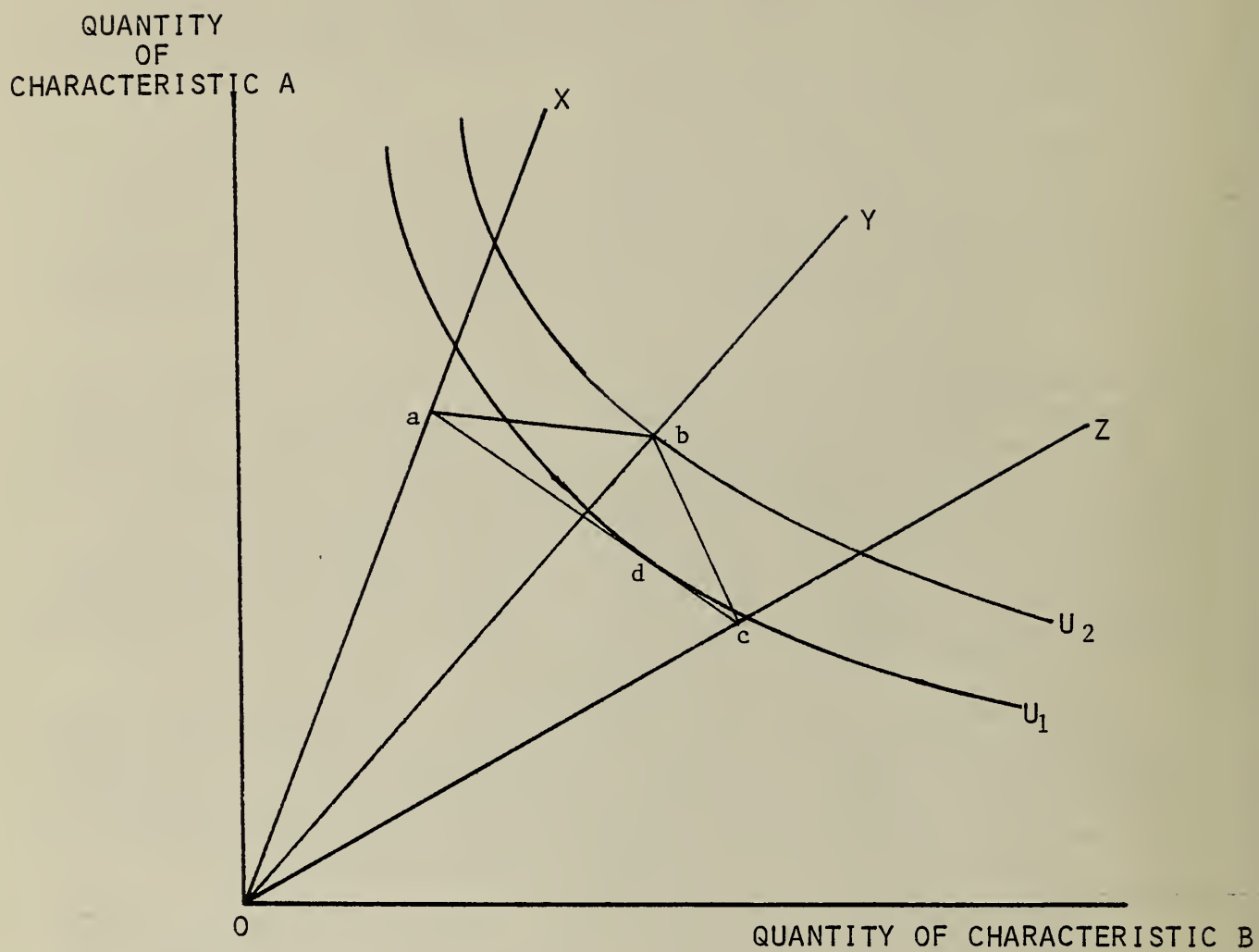


FIGURE 2. LANCASTER MODEL

Lancaster also notes that there is no mechanism in the marketplace for correcting consumption inefficiency. The individual consumer located at point d is not aware of utility foregone due to ignorance. In contrast producer inefficiency is punished and efficiency rewarded through the profit and loss mechanism.

2.1.3 Estimating the Direct Gains from Consumer Product Information

The direct consumer gains from product information may be estimated by comparing changes in consumer surplus due to product information. The market demand for a product is given in Figure 3. Price and quantity are measured on the vertical and horizontal axes respectively. The demand curve represents the consumers' willingness to pay for the product while the market price represents the amount that is actually paid.* The difference between willingness to pay and actual expenditures comprises consumer surplus or the benefits to the consumer from consumption. Thus in Figure 3 consumers are willing to pay $0abQ_1$ for $0Q_1$ units while actual expenditures only amount to $0P_1bQ_1$. Consumer surplus from the purchase of $0Q_1$ units for a price of P_1 is thus equal to P_1ab .

As the diagram indicates the lower the market price the greater the surplus accruing to the consumer. Thus a decline in the market price from P_1 to P_2 would increase consumer surplus to P_2ac .

2.1.3.1 Comparable Products for Different Prices

Gains in the case of comparable products are based on the existence of different product prices in the marketplace for comparable products--a higher price which is paid in the absence of information and a lower price which is paid once the consumer is informed. For example, a subscriber to a comparative testing magazine might find two comparable products with different prices. Thus in Figure 3 the uninformed consumer may pay P_1 while the informed consumer would pay P_2 . The change in consumer surplus when the product is purchased for P_1 compared to P_2 is given by the area P_2P_1bc . It is comprised of the cost difference (P_2P_1bf) and the additional gain to consumers from the purchase of Q_1Q_2 units (fbc).

*The compensated demand curve should be used in estimating consumer surplus rather than the uncompensated demand curve. The two demand curves are identical when the income effect of a price change is zero. If the income effect of a price change is negligible, then the uncompensated demand curve may be used in place of the compensated demand curve.

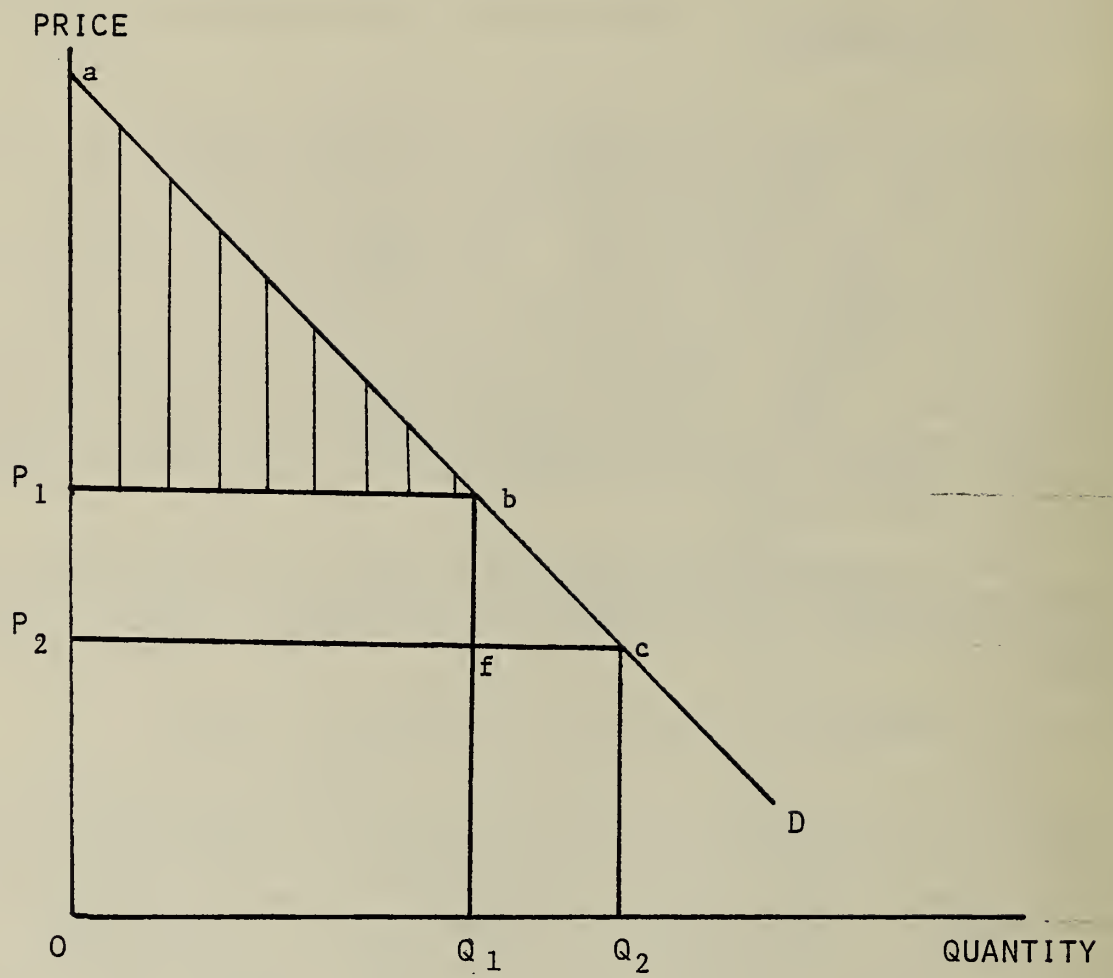


FIGURE 3. CONSUMER SURPLUS

2.1.3.2 Discrepancy Between Actual and Perceived Product Characteristics

Product performance information may affect existing users of the product as well as potential users. In the case of existing users it is convenient to consider two demand curves--a true demand curve and a false demand curve.* The true demand curve reflects the consumers' willingness to pay based on actual performance characteristics, while the false demand curve reflects the consumers' willingness to pay based on perceived performance characteristics. If the consumer is uninformed, there is a gap between actual and perceived performance characteristics and hence between the two demand curves.

Two situations are possible when the consumer is uninformed. First, consumers may overrate performance characteristics so that the false demand curve lies to the right of the true demand curve. In the second instance consumers may underrate the performance characteristics so that the false demand curve lies to the left of the true demand curve.

The first situation is illustrated in Figure 4a. The true and false demand curves are given by D_t and D_f respectively. Uninformed consumers are willing to pay more for every quantity than is justified since the product performance is overrated. When the market price is P_1 consumers purchase Q_1 units. However, based on actual performance only Q_2 units should have been purchased. The loss to consumers from purchasing the additional Q_2Q_1 units is given by the difference between consumer expenditures on these units (Q_2abQ_1) and willingness to pay for these units (Q_2acQ_1). The gain from product performance information is thus given by the shaded area abc in Figure 4a.

The second situation--product performance underrated--is shown in Figure 4b. In contrast to the first example, uninformed consumers are willing to pay less for each quantity than is justified by actual product performance. When the market price is P_1 , consumers purchase Q_1 units. However, Q_2 units should have been purchased based on actual performance characteristics. The loss in this instance arises from the failure to purchase the additional units Q_1Q_2 . The difference between the consumers' willingness to pay (Q_1cbQ_2) and actual expenditures (Q_1abQ_2) results in a loss of abc which is equivalent to the gain from consumer information.

The final benefit from product performance information pertains to the entry of new purchasers in the marketplace for a product once they are informed. Thus if the demand curve in

*The concept of true and false demand curves was introduced by Peltzman in 1974 (29).

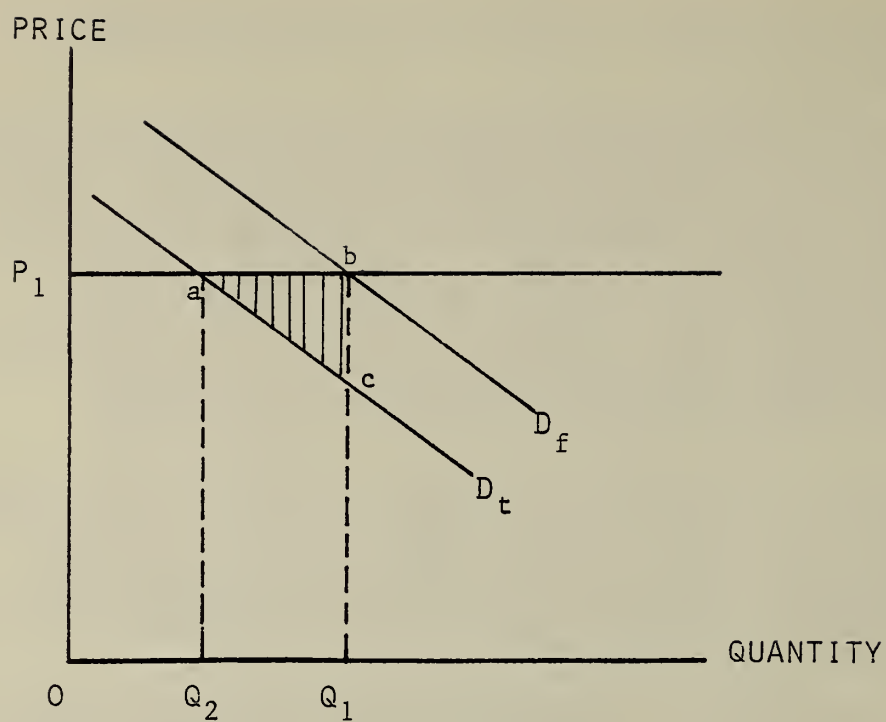


FIGURE 4a. PRODUCT PERFORMANCE OVER-RATED

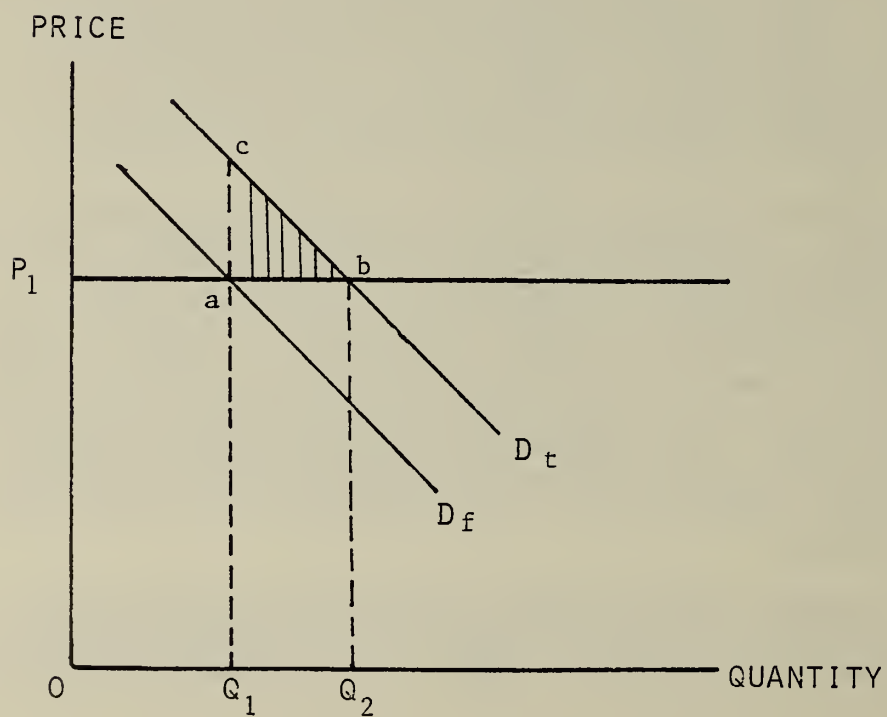


FIGURE 4b. PRODUCT PERFORMANCE UNDER-RATED

Figure 3 represents new purchasers due to product information, the consumer surplus accruing to these purchasers when the market price is P_1 is given by the shaded area P_1ab .

The previous discussion is based on unchanged market prices once the consumer is informed. This is correct in the short-run only if the industry supply curve is perfectly elastic. If the supply curve is upward sloping, then the change in demand for the overrated product (Figure 4a) will also result in a price decline and a further increase in consumer surplus. Thus benefits will have been underestimated. The converse occurs in the case of an underrated product or of entry of new purchasers since the market price will rise. Assuming no barriers to entry in the affected industries and the existence of equilibrium conditions initially, price decreases or increases will result in the exit and entry of firms in the long run. If the affected industries are characterized by constant costs (i.e., factor prices remaining unchanged as output changes), then market prices should return eventually to their initial levels. Thus the method is correct for estimating consumer gains in the long run.

The greater the disparity between actual and perceived product performance, the greater the benefits from product information. It should be noted that this disparity is likely to be affected by frequency of product purchase and the degree of technological change associated with the product since both affect the degree to which consumers can rely on past consumption experiences. The more infrequently purchased the product, the less opportunity the consumer has to explore his consumption possibilities set. It might be concluded, therefore, that consumer information is of particular importance in the case of high technology durable consumer goods.

Finally, not all of the direct benefits of product performance information were included in this section. For example, a major benefit in the case of durable goods is a reduction in product failure and repair costs due to correct maintenance or purchase of a more reliable product. Benefits could be estimated by comparing changes in life cycle costs with provision for time spent in repairing the item. However, it is difficult to estimate other non-monetary costs such as consumer annoyance and frustration.

2.2 Indirect Benefits

The indirect benefits from consumer product information pertain to the impact of consumer ignorance on market structure, performance, and product quality. The resulting losses in consumer welfare comprise a measure of indirect benefits, i.e., elimination of such a loss constitutes the indirect benefits associated with consumer information.

2.2.1 Market Structure and Performance

According to Scitovsky (35) consumer ignorance affects market structure and performance in the following ways:

- 1) it reduces competition based upon price and quality,
- 2) it increases the use of advertising,
- 3) it creates a barrier to entry for new firms by setting a high entrance fee, and
- 4) it facilitates collusion among existing firms since their number is limited.

Scitovsky points out that the ignorant consumer is unable to evaluate product quality and must use, therefore, indices of quality such as price and firm size and reputation. As a result price and quality competition is reduced since a lower price will be considered as a sign of inferior quality, while the incentive for quality competition is removed by the inability of the consumer to distinguish good quality from bad. Firms in this situation are more likely to engage in other forms of competition such as advertising.

Scitovsky also notes the importance of "advertising, service, and good will" in the uninformed market as a deterrent to potential entry of new firms (35, p. 50). He believes that advertising and product servicing are characterized by economies of scale, thus favoring large firms and inhibiting firm entry. However, firm's goodwill or consumer reliance on firm size and reputation constitutes in Scitovsky's view the most important obstacle to entry. The slow and costly process of establishing a name and reputation in competition with established firms constitutes a type of entrance fee which serves to protect those firms.

One of the more interesting arguments presented by Scitovsky is that the organization of the market and the degree of product standardization or differentiation are variables which are determined by (rather than determine) the degree of buyers' information. Thus expert buyers generate one type of market structure while ignorant buyers generate and perpetuate an oligopolistic market structure. If this viewpoint is correct, then consumer information programs may be as important as antitrust action in ensuring competitive conditions in the economy.

2.2.2 Product Quality*

Scitovsky comments on the tendency for producers to refrain, due to consumer ignorance, from product quality improvements (35). However, consumer ignorance may stimulate product deterioration. The incentive for this was mentioned by Chamberlin in 1953.

Any producer, by deteriorating his product slightly, can reduce his cost and increase his profits, either by selling at the same price as before, which would give him a greater profit per unit, or by combining the deterioration with a lower price, which is what happens more usually, and thereby increasing profits by taking business away from his rivals. (3, p. 25)

Chamberlin concludes that product deterioration may continue until the technological limits of product deterioration are reached.

The fact that consumer ignorance serves as a deterrent to product improvement while stimulating product deterioration results in a loss to the consumer in several ways. First it reduces consumer choice since it is likely that the manufacturer of the higher quality product will respond to the potential loss of business by also reducing product quality and price. In Chamberlin's paraphrase of Gresham's law "bad products drive good products off the market" (3, p. 26). According to Akerlof this development is a major cost of dishonesty.

There may be potential buyers of good quality products and there may be potential sellers of such products in the appropriate price range; however, the presence of people who pawn bad wares as good wares tends to drive out the legitimate business. The cost of dishonesty, therefore, lies not only in the amount by which the purchaser is cheated; the cost also must include the loss incurred from driving legitimate business out of existence. (1, p. 495)

*Quality, in this analysis, is defined as a set of product characteristics, including appearance and performance, which differentiates one product from another. Homogeneous products have identical product characteristics in contrast to heterogeneous products. In some instances, heterogeneous products may be of comparable quality, i.e., a deficiency with respect to one set of characteristics may be compensated by the presence or level of other product characteristics. Finally, the determination of a product's overall quality will depend on the relative importance attached to various product characteristics which may vary from consumer to consumer.

The second loss component is due to the fact that product deterioration and adulteration may result in levels of product quality which would be rejected if they were known. Chamberlin mentioned informative labeling for food and drug products as a means of counteracting this situation since labeling would enable the consumer to judge the acceptability of the product with respect to both price and quality (3). A recent study by Lenahan, et al., concerning nutritional labeling also found considerable consumer interest in such labeling as a means for making the food manufacturers accountable for the nutritional quality of their food products (19).

3. ECONOMICS OF INFORMATION ACQUISITION

The influence of information costs and benefits on the consumer's search activity is discussed in this section.

3.1 Information Process

According to Nelson (28), consumer goods may be classified into two major categories with respect to the consumer information process. Search goods comprise the first category while experience goods comprise the second category. Thus the consumer may obtain information concerning product quality and performance prior to purchase by the process of searching for and acquiring information, or the consumer may rely on actual experience with the product during consumption to provide information. The particular information process used by the consumer will depend on the cost of the process. Thus "there will be goods for which this search procedure is inappropriate-- goods it will pay the consumer to evaluate by purchase rather than by search. If the purchase price is low enough, any even moderately expensive search procedure would be ruled out" (28, p. 312).

The experience process has an advantage over the search process in that the consumer's own subjective preferences are involved in product evaluation. In the case of the search process the consumer must rely on information sources which may differ from the consumer in their assessment of the relative merits of different quality attributes. Thus product A may be ranked higher than product B when one set of weights is assigned to quality attributes, but may be ranked lower than product B if another set of weights is assigned. The ideal situation is obtained when the consumer, himself, assigns weights. This only occurs when the consumer has the opportunity to sample and experience a variety of products within a relatively short period of time.

Experience, however, can be a costly method for obtaining information if the product is expensive or has a major impact on

the health or safety of the consumer. It may also be inadequate in the case of infrequently purchased products since the consumer is in a position to purchase only a few items throughout his lifetime. For this reason the search process is likely to be preferred for expensive durable goods, i.e., high risk goods. In the case of low risk goods (inexpensive, frequently purchased items) experience is likely to be preferable.

3.2 Determinants of Search Activity

Two major kinds of information which may be obtained in the search process are price and quality information. Stigler's classic article on the economics of information pertains to the search for price information (39). Stigler discusses the determinants of search by consumers as follows: "The larger the fraction of the buyer's expenditures on the commodity, the greater the savings from search and hence the greater the amount of search" (39, p. 219). Techniques for minimizing the costs of search include pooling of information and reliance on advertising. Stigler points out that price advertising is "equivalent to the introduction of a very large amount of search by a large portion of the potential buyers" (39, p. 224).

The consumer decision process with respect to search activity is illustrated in Figure 5. The incremental costs and benefits from obtaining each additional unit of information are measured on the vertical axis while the level of information is measured on the horizontal axis. The marginal costs (MC) of search include financial costs as well as non-monetary costs such as time and dislike for the search process. The marginal costs of acquiring information are low initially reflecting the availability of some information for the uninformed consumer. However, as the scope of the search activity is increased the marginal costs will rise reflecting travel, time, and other costs in acquiring and processing the information.

The marginal benefit (MB) curve reflects diminishing returns to the consumer from the search process. While the uninformed consumer may experience considerable benefits in the initial stages of information acquisition and processing, the benefits may be expected to decline as the degree of information increases. Total benefits will increase but at a decreasing rate.* As in the case of costs, benefits include both monetary and non-monetary considerations. The consumer may experience cost savings during purchase or throughout the product life cycle. In addition disutility due to product failure and time spent on repairs is reduced.

*It is possible that marginal benefits might increase initially. However, the law of diminishing returns should prevail eventually. Under such circumstances the MB curve would first increase and then decrease.

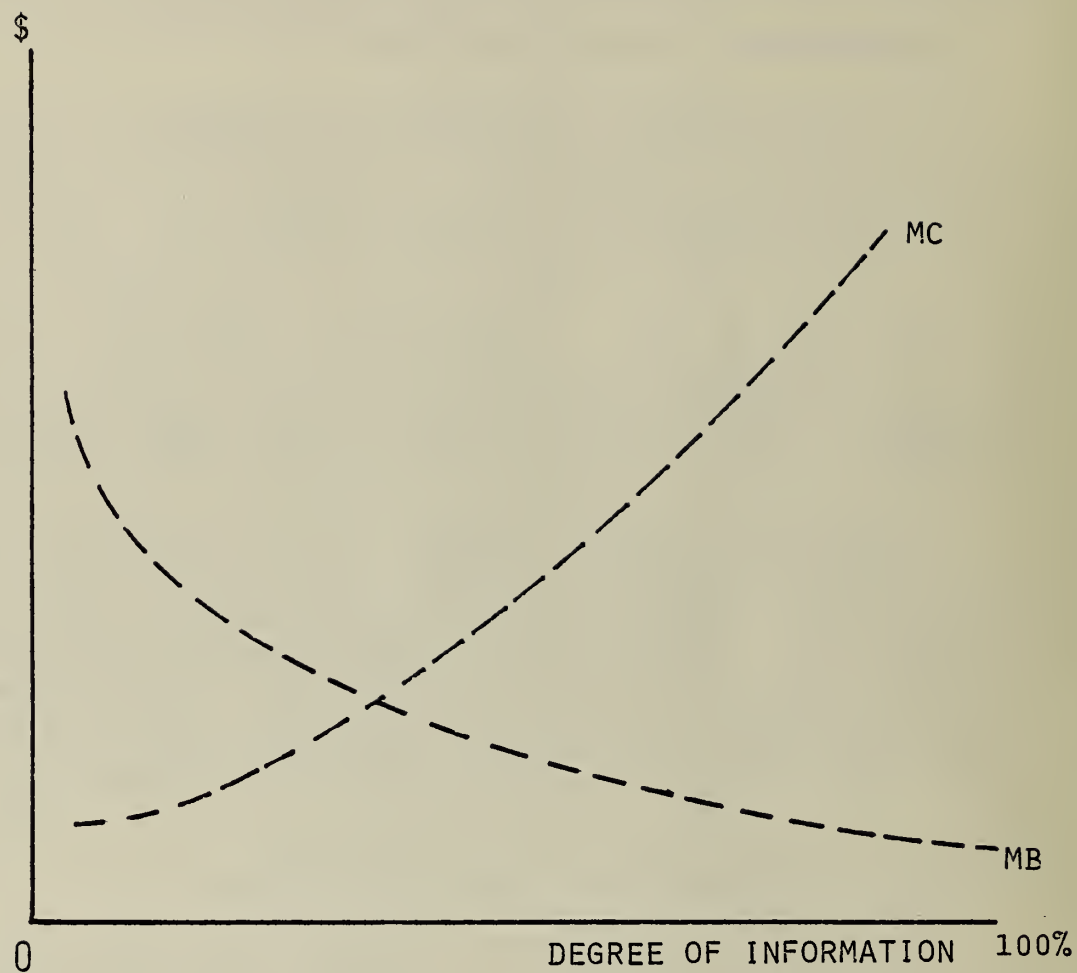


FIGURE 5. THE CONSUMER'S SEARCH PROCESS

The optimum degree of information which the consumer should obtain is given by the intersection of the marginal cost and marginal benefit curves. If the search activity continues beyond this point the additional costs of acquiring and processing information will be greater than the benefits. The degree of information acquired by the consumer is thus a function of perceived costs and benefits. If the perceived costs are high relative to the perceived benefits then the level of information acquisition will be low.

Failure to use information, should not, therefore, be attributed to consumer "irrationality" but rather to the costs of acquiring and processing existing information relative to the perceived benefits.

The analysis also indicates two methods of increasing the consumer's level of information. The first method is to alert the consumer to the potential benefits from obtaining product information. If the perceived benefits are less than the actual benefits then the information level will be less than optimum. The second method is to reduce the costs of obtaining information, thus shifting the marginal cost curve to the right. For example, the cost to consumers from generating product information is likely to be considerably higher than the costs of buying information generated by others, e.g., comparative testing and informative labeling. However, complex technical information may impose high information processing costs on the consumer thus shifting the marginal cost curve to the left. The net effect of any information program must be considered, therefore, in evaluating its effectiveness.

4. THE CONSUMER INFORMATION GAP

In 1945 Scitovsky (34) made two major observations concerning price-quality relations for products. He noted that the consumer used price as a measure of quality since the consumer was an inexperienced buyer. However, Scitovsky stated that while it was rational to judge quality by price in an expert's market, it was not rational to do the same in a layman's or consumer's market. Thus price and quality were unlikely to be related.

Scitovsky's first hypothesis was the subject of several studies in the late 1960s and early 1970s (2,10,11,15,18,23,32,38). Most of the studies confirm Scitovsky's hypothesis though it was found that the influence of price was reduced when other quality indices such as brand name and store were also provided to the consumer. Monroe (23) also suggests that the consumer's perception of the price-quality relations might vary according to product category and price.

Major tests of Scitovsky's second hypothesis--that the consumer goods market was characterized by inexpert buyers resulting in the absence of positive price-quality relations--were conducted by Morris and Bronson (24,26), Sproles (37), and Gieser (9). The results of these studies also confirm Scitovsky's second hypothesis and indicate a consumer information gap which does not appear to have narrowed to any great extent within the past twenty years. The results of three studies are summarized in the following sections.

4.1 Morris and Bronson, and Gieser Studies: 1960-1977

4.1.1 Procedure

Both Morris and Bronson (24) and Gieser (9) used data from Consumer Reports. This publication provides information concerning product testing results and market prices. Products are listed in order of overall quality. The use of Consumer Reports' data to investigate price-quality relations has been discussed in Maynes (21) and Morris (25). In general the testing agency's reputation and integrity is viewed as a major strength, while the determination of the product's overall quality rating is viewed as a major limitation. Thus the assignment of weights to different product attributes is to some extent subjective, and the weights assigned in Consumer Reports may differ from those which would be used by some consumers. In addition certain factors such as design or style are not considered in the quality ratings which are based on objective considerations. Consumers might be willing to pay more for some products with certain design and style features. Place of purchase is another factor which might influence the price the consumer is willing to pay in view of variations in store services. However, the fact that the average market prices provided in Consumer Reports were obtained from a variety of stores mitigates this factor somewhat.

Price-quality relations were analyzed in both studies using Spearman's coefficient of rank correlation since products were only ranked with respect to quality. The use of ordinal data is an inherent limitation since, as Sproles states, "a highly positive rank correlation does not suggest that each increase in price will be accompanied by an equally incremental increase in quality" (37, p. 75). Sproles notes that a large increase in price could be accompanied by a small increase in quality though the contrary was also possible.

Notwithstanding such limitations, data from Consumer Reports may be regarded as one of the most comprehensive and objective data sets for investigating the existence of the consumer information gap.

4.1.2 Results

In order to permit a comparison of price-quality relations over time, only data for the following five product categories are discussed.

White Goods: dishwasher, dryer, freezer, garbage disposer, microwave oven, range, refrigerator, washing machine

Brown Goods: radio, recorder, record changer, stereo, T.V.

Other Major Appliances: dehumidifier, sewing machine, vacuum cleaner, room air conditioner

Small Appliances: blender, food mixer, hair dryer

Cameras: 35 mm, movie, pocket.

Price-quality relations from 1960-67 and 1970-77 are given in Table 1 for combined product categories. There were a relatively small number of products reported for the 1960-67 time period, and this should be borne in mind in evaluating the results. Twenty-seven percent of the product tests in 1960-67 have significant positive price-quality relations compared to 31 percent for the 1970-77 time period. The corresponding figures for the median rank correlation coefficients are 0.41 and 0.31.

There are considerable fluctuations from year to year in the percentage of product tests with significant positive price-quality relations. The percentage ranges from 0 (1960, 1965, 1967) to 44 (1966, 1977). While there is an improvement over time, it is relatively small. There are also fluctuations in price-quality relations in a given year as shown by the range for the rank correlation coefficients. Thus some product markets in a given year are performing in a satisfactory manner while others are unsatisfactory. However, the pattern is inconsistent from year to year. Further examination of the data reveals that product markets which are satisfactory in one year may be unsatisfactory in another year. Both Morris and Bronson (24) and Gieser (9) found positive and negative correlation coefficients for the same product over time.

The low percentage of product tests with positive price-quality relations, the low correlation coefficients, and fluctuations in price-quality relations suggest the existence of inexpert buyers' markets. As Scitovsky points out, in such a case it is no longer rational to judge quality by price.

Price-quality relations by product category are given in Table 2. Again the small number of observations for the 1960-67 time period limits product comparisons. For the 1970-77 time period cameras had the greatest percentage of significant tests

Table 1. Summary of price-quality relations
by time: 1960-1977.

Time Period	Number of Product Tests	Percentage of Significant Relations	Rank Correlation Coefficient	
			Median	Range
1960	1	0	.41	.41
1961	3	33	.15	.41 to -.12
1962	5	20	.33	.57 to .20
1963	8	25	.39	.74 to -.04
1964	5	40	.41	.93 to -.12
1965	4	0	.34	.41 to .30
1966	9	44	.39	.96 to -.23
1967	2	0	--	.48 to .38
1970	12	33	.39	.60 to -.42
1971	12	41	.31	.75 to -.03
1972	15	20	.27	.69 to -.35
1973	9	22	.22	.74 to -.50
1974	17	23	.23	.84 to -.39
1975	10	30	.42	.59 to -.83
1976	12	33	.32	.58 to -.66
1977	18	44	.57	.86 to -.27
1960-1967	37	27	.41	.96 to -.23
1970-1977	105	31	.31	.86 to -.83

Source: 1960-1967 Morris and Bronson (24)
1970-1977 Geiser (9)

Table 2. Summary of price-quality relations by product category: 1960-1977.

Time Period	Results	Product Category					
		White Goods	Brown Goods	Other Major Appliances	Small Appliances	Cameras	Total
1960-1967	No. of product tests	19	4	9	3	2	37
	Percentage of significant tests	21	25	33	0	100	27
	Rank correlation coefficient						
	Median	.38	.41	.38	.33	--	.44
1970-1977	Range	.68 to -.19	.59 to -.23	.93 to .15	.39 to .17	.96 to .91	.96 to -.23
	No. of product tests	28	36	16	9	16	105
	Percentage of significant tests	18	33	37	33	44	31
	Rank correlation coefficient						
	Median	.29	.40	.29	.11	.42	.31
	Range	.84 to -.83	.74 to -.70	.86 to -.31	.75 to -.26	.75 to -.65	.86 to -.83

Source: 1960-1967 Morris and Bronson (24)

1970-1977 Gieser (9)

(44%), while white goods had the smallest percentage of significant tests (18%). The corresponding median rank correlation coefficients are 0.42 and 0.29 respectively. The results for brown goods and other major appliances are fairly similar, while the number of observations for small appliances is too few for comparison. A comparison of data for white goods from the 1960-67 to 1970-77 time periods indicates that the market performance for this product category has declined. There has been a decline in both the percentage of tests that are significant (21% to 18%) and the median rank correlation coefficient (0.38 to 0.29).

4.2 Sproles Study: 1972-74

Sproles (37) used data from both Consumer Reports and Consumer's Research Magazine. While the time period was shorter, the scope of products covered was more extensive thus permitting an investigation of the impact of product category on price-quality relations.

Sproles' results are summarized in Table 3. A total of 135 product tests were analyzed for five product categories. The variations in the rank correlation coefficients were extensive in each instance. However, there was a considerable difference in the percentage of product tests with significant positive price-quality relations. The best market performance on the average was given by sports equipment (60%), followed by home items (36%), while the worst market performance was given by tools (21%) and large appliances (24%). Sproles concludes that an "objective price-quality relation cannot be generalized across product and product categories" (37, p. 74). However, he does not elaborate on the differences between product categories. One possible explanation for the sports equipment results may be the expertise of the buyer and/or salesperson. Gieser (9) also found good market performance for cameras and sewing machines--both areas where buyers might be more specialized and hence more expert.

Sproles' results for large appliances are not too dissimilar from those obtained by Gieser for major appliances. Thus 24 percent of the product tests analyzed by Sproles had positive significant price-quality relations compared to 27 percent for Gieser (white goods, brown goods, and other major appliances). Since large appliances are big-ticket, high-risk items, one would expect more extensive consumer shopping and search behavior for such items. Thus the poor price-quality relations obtained in both studies are somewhat surprising.

Table 3. Summary of price-quality relations by product category: 1972-1974.

Product Category	Number of Tests	Percentage of Significant Tests	Rank Correlation Coefficient	
			Median	Range
Large appliances	38	24	.29	.86 to -.56
Small appliances	54	28	.28	.86 to -.66
Home items	14	36	.34	.67 to -.50
Tools	14	21	.31	.85 to -.46
Sports equipment	15	60	.63	.90 to -.57
Total	135	30	.34	.90 to -.66

Source: Sproles (37)

4.3 Conclusion

In spite of data limitations the following general conclusions may be drawn from the studies by Morris and Bronson, Gieser, and Sproles:

- 1) markets for consumer goods are functioning imperfectly,
- 2) market performance has not changed greatly within the past two decades,
- 3) price-quality relations are characterized by considerable instability,
- 4) price-quality relations for high risk products such as major appliances reflect an absence of search behavior by consumers, and
- 5) some markets have positive price-quality relations suggesting the existence of expert buyers.

5. REASONS FOR INFORMATION FAILURES IN THE MARKETPLACE

5.1 Background

According to Thorelli (41) several changes have occurred in the past decades which have increased the complexity of the consumer decision process and reduced the information disseminating capability of the marketplace. Technological change has resulted in changing product characteristics and the replacement of existing products by new products. The consumer can no longer rely on past experience to evaluate products. There has been a proliferation of models, brands, and products, thus increasing the number of items for which the consumer must seek information. In addition, the operation and maintenance of new products has become more complex.

The increase in scope and complexity of the consumer's choice set has been accompanied by an increase in mass production and distribution and ensuing impersonalization in the marketplace. Personal selling, once an important source of product information, has diminished in importance in an era of self-service. Finally, the consumer faces a time constraint in obtaining the necessary information. According to Linder (20) the time constraint may be the ultimate constraint in the post-industrial society. As a result the consumer may be less willing today to search for information, even though the need for obtaining information has increased.

5.2 Responses to the Information Gap

The information gap was created by major technological and social changes. However, actions by sellers and buyers could reduce this gap. It is important, therefore, to consider what incentives, if any, exist in the current market system for correcting the situation.

Standards are one method for providing product information. The consumer, in this instance, is provided with the assurance that the product meets a certain level of performance though he may be uninformed about the specific product characteristics or performance levels on which the standard is based. However, industry opposition to standards was noted as early as 1929 by the National Industrial Conference Board.

Wherever extensively explicated trade or brand names or patent rights are involved, standardization has made little headway. The object of trade and brand names is to build up good will and lift goods out of competition. The object of standards or specifications is primarily to eliminate superficial differences and to center attention on price. Manufacturers do not want to sacrifice a trade advantage based on good will secured through the popularization of trade or brand name by admitting that their product is made according to a specification followed by the entire trade. (27, p. 260).

Recently Hemenway (12) conducted a survey of voluntary standards for producer and consumer goods and found a lack of useful voluntary standards for consumer goods. He attributed this result to lack of organization on the part of consumers, since buyers gain from standardization in general while sellers gain from product differentiation. It has been claimed by industry proponents that standards for many consumer goods are infeasible and inefficient in view of the diversity of consumer needs and usages.* Whatever the justification or explanation for the lack of consumer product standards, their absence places a heavy burden on other information systems in the marketplace since most consumer goods markets are characterized by the existence of inexpert buyers. Scitovsky (35) argues that manufacturers gain from operating in the inexpert buyers' market, since price and quality competition is reduced and consumer reliance on brand name and firm reputation is increased. There is, therefore, little incentive for oligopolists to reduce

*Minimum performance standards may tend to encourage uniformity of products, thereby reducing choice based upon quality and increasing price competition.

consumer ignorance which is the source of their market power and profits. Scitoysky's viewpoint is repeated in a Federal Trade Commission staff study which notes that "it is difficult to imagine any circumstance, for example, under which it would be profitable for the producers of one of the more highly differentiated consumer products to provide voluntarily its consumers with information on the actual performance ratings in the relevant dimensions of their respective offerings" (6, p. 15).*

Advertising, which is a major form of nonprice competition for oligopolists, also faces a conflict between producer and consumer self-interest. Schmalensee in his review of the role and effectiveness of advertising concluded that "markets in which advertising is most effective and hence most intensively employed are not necessarily those in which the value to consumers of available information is greatest" (33, p. 86). Schmalensee also noted that little advertising was "devoted to comparison of competing products, and when such comparisons are made by sellers they involve only a few carefully selected dimensions of quality that might not be most relevant to consumers" (33, p. 86). He concluded that the current system of seller provided information results in a mix of information and an emphasis on subjective as opposed to objective considerations, which would differ if the information were being provided by a disinterested third party.

The dearth of informative labeling was also noted by an FTC staff study in 1972.

The consumers' principal source of product information, commercial advertisements, have for the most part been focused less on the objective performance characteristics of the advertised products than on the psychological associations they permit. In short, there is a growing recognition of the consumer's need for greater factual information on the products he is asked to buy and of a duty on the part of the seller to provide it in a form that will permit the consumer to exercise an informed choice among competing products. (6, p. 3)

*The FTC Precis was never officially approved by the Commission. However, the FTC has conducted the investigation of standards and certification programs which was recommended in Precis. A proposed Trade Regulation Rule was issued in December 1978 (7).

In some instances the manufacturer may elect to emphasize the technical aspects of the product that is being advertised. However, Scitoysky warns that such advertising may be designed to increase consumer reliance on the firm rather than to facilitate consumer choice.

Manufacturers are often aware of the fact that the security of their oligopoly position depends on and increases with the ignorance of their customers. At least they often pursue an advertising policy that seems deliberately aimed at impressing the consumer with his own ignorance. Hence the stress in some advertisements on the technical and chemical complexity of products. ...All such advertising carries the suggestion that the consumer, a mere layman, would be unwise to judge quality unaided by more inspection, and should rely instead on the guarantees offered by the reputation of established manufacturers. (35, p. 52)

While the consumer has the responsibility for obtaining and processing product information in the marketplace, there are several problems with respect to such activities. First, objective information on product characteristics and performance may be lacking. The cost to the individual consumer to generate information on his own accord may be prohibitive. Thus, Schmalensee states that there are economies of scale in information gathering and dissemination, and that the individual household, unlike the industrial buyer, cannot purchase "ten autos or five hundred light bulbs and subject them to extensive testing" (33, pp. 86-87). Second, the costs of information processing may be high in view of the technical requirements, lack of comparable information for different brands, and time constraints. As a result of both these factors, the consumer may rely on other strategies for obtaining information about the product. Price is frequently used by consumers to judge quality. However, the major problem with this strategy, as Scitovsky points out, is that it assumes the layman is operating in an expert's market and most consumer markets consist of inexpert buyers. The fact that consumers continue to use price as a measure of quality may reflect the belief that the system is working, i.e., there are expert buyers in the market, or a lack of other types of information (33,34). The second strategy open to the consumer is to rely on the expert judgment of the manufacturer or distributor. Thus firm size and reputation serve as indices of product quality. This also may be an inappropriate strategy since there is no reason to expect the interests of buyers and sellers to coincide. In the inexpert buyers' market, the interests of the sellers dominate. However, there is nothing in the existing market mechanism which signals consumption inefficiency to the inexpert buyer, so the consumer has no incentive to change his behavior pattern. Since it is not

profitable for the seller to change either, it appears that the current system is unlikely to correct information failures in the marketplace.

6. SOLUTIONS TO THE PROBLEM

In theory, a market for information should operate in the same manner as other markets, so that the amount and price of information is determined by demand and supply conditions. However, changing consumption technology and the provision of "free" information by sellers in the form of advertising or personal selling distorts both demand and supply conditions. Consumers, as Lancaster points out, may be unaware that they are operating within their efficiency frontier, and the market mechanism provides no signals of such behavior. Hence, the demand for information is understated. The availability of "free" information is also a deterrent to independent organizations, who must impose a direct charge for information.

In addition to demand and supply deficiencies, the existence of externalities due to indirect benefits must be considered. Thus the benefits from product information acquisition include direct benefits (consumption efficiency) and indirect benefits (market efficiency and product-quality control). Indirect benefits accrue to all consumers but can only be realized if a sufficient number of consumers are informed. Thus the individual consumer is likely to discount such benefits since the actions of one person will have little market effect. Failure to recognize the indirect benefits from product information by consumers as a whole will result in a less than optimal level of information in the marketplace.

Voluntary and mandatory consumer information programs are discussed in the following sections.

6.1 Voluntary Information Programs

Voluntary programs include comparative testing, informative labeling, standards, and quality certification.

6.1.1 Comparative Testing

Comparative testing is conducted by independent organizations. The organization selects products and brands for testing and also determines what characteristics should be tested and the appropriate test methods. Two types of information may be supplied: specific information concerning major product characteristics and overall product rating. In the latter instance the overall rating may be combined with a consideration of price to indicate the "best buy." One limitation of the overall rating scheme is that the weights used in obtaining this

rating scheme is that the weights used in obtaining this rating are to some extent subjective. A different set of weights will result in changes in product rankings.

Examples of comparative testing organizations in the U.S. are Consumers Union and Consumers' Research.

6.1.2 Informative Labeling

This program is also based on test methods which describe performance levels for various product characteristics. The resulting information is then provided on the product label. In contrast to comparative testing, there is no overall product rating. Instead, separate ratings are provided for each product characteristic leaving the determination of appropriate weights to the consumer. The determination of relevant product characteristics and the test procedures for evaluating such characteristics generally involves participation from a broad range of interests including business and industry, government, and consumers.

In theory informative labeling permits the labeling of different quality products with consumer response indicating what quality levels are desirable. In practice, however, manufacturers of low-quality products may not elect to participate in the program or may upgrade the product line. Such possibilities may explain the belief by "a significant minority of consumers" that labels are a type of quality guarantee (42, p. 102). Informative labeling should, therefore, be accompanied by consumer education to prevent possible consumer misuse of labels.

Proponents of informative labeling claim that it provides for individualized decision-making by consumers since information is provided on several product characteristics. Informative labeling also facilitates information processing since the information content and format is standardized. Thus product comparisons are facilitated. Opponents of informative labeling disagree with the information processing claim and argue that labeling will result in standardized products, and hence a reduction in consumer choice. However, there is no indication that this has occurred in Europe when informative labeling was used (42,43). There seems to be no reason why standardized information should result in a standardized product. In fact, the availability of comparable information for different brands may permit consumers to express their "true" wants to a greater extent than they do under the current system. If consumer wants are similar, then the resulting standardization can only be beneficial since there will be improvements in production efficiency. If consumer wants are dissimilar, then manufacturers will be encouraged to differentiate their products on the basis of real as opposed to superficial product characteristics (42).

An example of informative labeling in the U.S. is nutritional labeling. This program was developed by the Food and Drug Administration in collaboration with the food industry in 1971-72. The program is voluntary but provides for mandatory labeling when nutrients are added or nutritional claims are made for products.

6.1.3 Standards

The following definition of a standard was given by Coles, one of the pioneers in the field of consumer goods standardization.

A standard is a physical, written, graphic or other representation of a product or a procedure established by authority, custom, or general consent with which other products or procedures of a like nature are compared for identification or measurement or to which they are made to conform.
(5, p. 107)

Coles (5) points out that standards and informative labeling are closely related. Thus "standards are not effective as a means of describing goods unless they are used on labels where consumers can obtain the information" (5, p. 105). Both standards and informative labeling are based on standardized test methods.

Standards may be voluntary or mandatory and may pertain to product design or performance. Performance standards according to Coles offer two major advantages over design standards. First, they are of greater interest to the consumer who is more concerned with factors such as durability, efficiency, economy of operation, and care than product composition. Secondly, they permit flexibility of response on the part of manufacturers who are not constrained from using new or different materials in making products which comply with the standard.

Standards are used in product grading. In the case of minimum standards, goods are assigned two grades--acceptable and unacceptable. In other instances several grades may be provided for a single product category, with products within each grade possessing "similar though not necessarily identical characteristics" (5, p. 137). Grade labeling is then used to indicate the grade to which the product belongs.

A standard may be used to describe one product characteristic or several product characteristics. The latter increases the complexity of the standard setting operation. Much of the debate concerning voluntary standards for consumer goods has focused on the problems in identifying and measuring relevant product characteristics and in combining several characteristics

in a single standard. While informative labeling suffers from the same problems with respect to identification and measurement of characteristics, it is not required to combine these characteristics. As a result, the determination of the relative importance of various product characteristics is left to the discretion of the consumer.

Problems in establishing "acceptable" standards has been cited as a major reason for producer opposition to standards. However, both Scitovsky (35) and Hemenway (12) point out that seller opposition is also due to their reluctance to sacrifice the advantages of brand name and firm reputation. While consumers have perceived the benefits of voluntary standards, they have suffered from lack of organization and have hence been ineffective. As a result of these factors it is not surprising that Coles' findings concerning the lack of voluntary standards for consumer goods were repeated by Hemenway fifteen years later (5,12).

6.1.4 Quality Certification

Quality certification is similar in concept to minimum standards. Thus a product with a quality certificate must meet a threshold level of performance or materials content. The threshold level and procedures for establishing products to meet this level are determined by the certifying agency.

Quality certification provides less information than informative labeling since the degree to which the threshold is exceeded is not provided. However, quality certification provides more information to consumers concerning minimum levels of performance if all products of a category are submitted for certification. Products falling below the minimum are not certified. Quality certification may be combined with informative labeling if threshold levels of performance are required for all products carrying informative labeling. Thorelli notes that there has been considerable debate on this requirement since it might result in "undue infringement of consumer as well as producer sovereignty" (42, p. 101). Quality certification may also be combined with standards by establishing a threshold level for the lowest quality standard. In instances where more than one quality mark is used for a single product category quality certification approaches grade labeling.

Examples of quality certification programs in the U.S. are those conducted by Good Housekeeping and Parents' Magazine. Thorelli cites the following major weaknesses with respect to these two programs: "the rules of qualification for any given product are unknown in terms of testing methods used, characteristics tested and minimum thresholds applied" (43, p. 455).

6.1.5 Warranties and Service Contracts

A final recourse for the uninformed consumer is to rely on express warranties or service contracts. Express warranties are written agreements provided by the seller to the buyers that the product will perform in a satisfactory manner for a certain period of time or will be repaired or replaced under certain specified conditions. Express warranties differ from implied warranties which are based on the common law principle that goods should perform as expected since such expectation is the basis for purchase.

Express or written warranties have been frequently criticized as providing more protection for the seller than the buyer. The Magnuson-Moss Warranty-Federal Trade Commission Improvement Act, which was signed into law on January 4, 1975, focused on improvements in the operation of express warranties. The major provisions of the act are described by McCall as follows:

Basically the Act divides all written warranties into two categories (Full Warranty or Limited Warranty) and specifies required labels, disclosures and terms for such warranties. Significantly, the Act also empowers the Federal Trade Commission to make detailed rules to supplement the provision of the Act. The broad grants of rule making power to the FTC give it authority to specify detailed requirements for the contents of written warranties and to establish detailed requirements for the disclosure of terms of written warranties. Additionally, the Act requires that certain substantive provisions be included in a written warranty before it can bear the desirable label, "Full Warranty." (22, p. 70)

Economic considerations involving the usefulness of warranties to consumers include costs to consumers and producers when warranties are broken. If the item is expensive, the consumer is likely to devote more time and effort in seeking legal redress than in the case of inexpensive items. The economic incentive for the manufacturer depends on the degree to which his market share or reputation is affected by failure to honor warranties. Thus manufacturers have more incentive when it is important to maintain customer patronage or when the customers are located in a relatively small market area. Infrequently purchased items, where there is little communication between buyers, provide less incentive for the manufacturer. Under certain conditions, therefore, the integrity of the seller may be as important as the written warranty.

Service contracts are used by consumers as a protection against frequent or expensive breakdowns. However, the uninformed buyer is in the position of purchasing a service whose need or utility he cannot assess. While service contracts reduce the risk from product ownership, the buyer may not know whether he is paying too little or too much for such risk reduction. Again, there is reliance on the judgment of sellers and, as Scitovsky warns, it is important to remember for whose benefit such judgment is exercised. Unnecessary service calls due to consumer ignorance may also inflate the price of service contracts. Thus consumer information is necessary if service contracts are to function effectively in reducing buyer uncertainty.

6.1.6 Role of Information Seekers

Voluntary information programs are also likely to be effective only if there is interest on the part of buyers and sellers. Buyer interest may be a primary factor since sellers will tend to respond to their actions. Thorelli (42) has designated a certain group of consumers, information seekers, as playing a critical role in the success of voluntary consumer information programs and hence in the effective operation of the marketplace. The concept is attractive since information processing costs are confined to a limited number of consumers. However, it is uncertain what is the critical mass of information seekers in a given market. If information seekers are few in number and do not influence other consumers by their actions, they may have little impact on the marketplace. Data from Consumer Reports mentioned in section 4 of this study indicate that "best buys" and "worst buys" continue to be offered for sale in the U.S. in spite of the increased interest in consumer information. This suggests that a critical mass of information seekers, with the exception of certain specialized product categories, has not yet been reached.

6.2 Mandatory Programs

Mandatory programs include informative labeling and standards. The latter program encompasses mandatory quality certification.

6.2.1 Informative Labeling

Mandatory labeling is generally used when information is deemed important to the national interest and voluntary programs are likely to be unsuccessful. For example mandatory care labeling for apparel was initiated by the Federal Trade Commission in 1972 when the voluntary program proved unsuccessful. While care labeling is not a performance label per se, it has an implied guarantee of product performance since the product should prove satisfactory if the appropriate care

procedures are followed. Examples of content or composition labeling as opposed to performance labeling are given by the Wool Products Labeling Act of 1939 and the Textile Fiber Identification Act of 1958. While these labels resulted in the provision of consumer information in the marketplace, they were designed primarily to protect manufacturers from product misrepresentation.

While mandatory labels are more restrictive than voluntary labels, they are less restrictive than mandatory standards. Thus warning labels for cigarettes and saccharine are designed to alert consumers to potential hazards to health without restricting consumer choice. In some instances mandatory labeling may be accompanied by a minimum performance requirement. The decision to require a threshold level of performance is more significant for mandatory labeling than for voluntary labeling. If threshold levels are required, then lower quality products will be removed from the marketplace resulting in a reduction in consumer choice.

6.2.2 Mandatory Standards

Mandatory performance standards are frequently advocated in the areas of safety and health, in particular when consumer information programs are deemed inadequate to reduce the hazard. However, since this type of regulation has the most pronounced impact on consumer choice, consideration should be given to the cost effectiveness of such regulations. Colantoni, et al., comment in their comparison of information and regulation that "as a benefit, direct control can remove alternatives that some people should not have chosen. However, it can also eliminate choices that some consumers should have made, which is a cost" (4, p. 613).

There has been less interest in mandatory standards in other areas. Thus Rothenberg in his review of the limitations of consumer sovereignty admitted that "if consumers knew more, knew better, were cured, were not as gullible, they would regret many of their present choices" (30, p. 282). However, he argues that the "right to be often wrong" is more important in our society than satisfaction of the consumer's "true" wants. Rothenberg states that the determination and satisfaction of the consumer's "true" wants is both infeasible and undesirable due to our existing state of knowledge with respect to consumer behavior and the threat of centralized decision-making to freedom of choice.

The argument for freedom of choice is based on the economic theory of consumer behavior in which the individual's unique preference function determines the optimum bundle of goods and services. While the preference function or the choice set may be distorted by consumer ignorance and advertising appeals, it is preferable to correct the causes of such distortions (or even to

live with them as Rothenberg believes) than to make decisions for consumers.

6.3 Comparison of Voluntary and Mandatory Programs

Several factors must be considered in assessing the relative merits of voluntary and mandatory programs. First, voluntary programs are likely to be less expensive since not all producers are required to participate and there are fewer costs of administration. Second, voluntary programs permit consumer choice in the marketplace between products with different degrees of information thus permitting feedback to business and regulators concerning the value of information to consumers. While voluntary programs are likely to encounter fewer problems with respect to implementation, they may be ineffective due to consumer inertia or producer opposition. Finally, voluntary and mandatory programs may be similar with respect to the information processing requirements since both programs may use a standardized format.

The following considerations are important for both voluntary and mandatory programs: 1) product purchase and/or consumption entails a certain risk with respect to consumer finances, health, or safety; and 2) information is not available in the marketplace, or existing information is inadequate to protect the consumer. Two additional factors are then necessary for the adoption of mandatory programs. They are 1) voluntary programs are likely to be unsuccessful and 2) program costs are less than the direct and indirect program benefits. Both of these stipulations reflect the fact that mandatory programs are not subject to the discipline of the marketplace and hence must be evaluated on criteria other than producer and consumer response.

Finally the information programs discussed in this section differ with respect to freedom of choice and consumer information processing requirements. Unfortunately, the two factors are in opposition to one another. Thus, voluntary informative labeling permits the greatest freedom of choice but its information processing requirements may be considerable. While standards and quality certification are more restrictive, in particular if they are mandatory, their information processing requirements are less. Program selection will thus depend on consumer needs and capabilities. The diversity of consumer interests is likely to require a corresponding diversity in consumer information programs so that no one program can be expected to solve the problem of the consumer information gap.

6.4 Consumer Protection and Producer Protection

Information labeling, quality certification, and product standards all involve determination of relevant product

characteristics and test methods for evaluating such characteristics. Determinations are generally made by committees consisting of representatives from business and industry, consumer organizations, and various public and private organizations. If the committees are dominated by large established firms, there is a possibility that their interests will tend to dominate the decision-making process to the detriment of the interests of smaller firms or consumers. The FTC staff report of 1978 concerning standards and certification contained the following conclusion. "Standards development and certification organizations have not adequately protected all of the interests affected by their activities. The procedures are capable of being, and have been, manipulated by large or established firms at the expense of consumers, small firms, new entrants, and others" (7, p. 5). The same staff report also noted that while private standard development and certification activities provide benefits, they have also entailed costs to the consumer. The following examples were cited: "denying consumers the benefits of superior or lower cost technology, denying businesses the opportunity to enter and compete in profitable industries, inadequate product safety levels, inflated product prices, deception or nondisclosure of material product information" (7, p. 3). The proposed Trade Regulation Rule by the FTC is designed to prevent such outcomes by specifying certain procedural safeguards for standard development and certification activities. However, this rule has occasioned considerable debate with respect to the costs and benefits of its implementation.

6.5 Economics of Information Provision

6.5.1 Major Issues

Major issues with respect to the provision of consumer information programs are 1) how much information should be provided, 2) what is the best mechanism for achieving the desired level of information, and 3) what is the distribution of program costs and benefits. The first two issues are interrelated as the following discussion will show.

Determination of the appropriate level of information depends on program costs and benefits. Thus an analysis, similar to that used for consumer information acquisition, is also relevant here.

The marginal costs and benefits of information provision are given in Figure 6. The marginal costs in the case of information provision are defrayed by both consumers and taxpayers. Thus, the provision of product information by the private sector will, in general, incur costs and these costs will be recovered through subscription fees to consumer magazines or through higher prices. Public sector programs are paid for by taxpayers. Both private

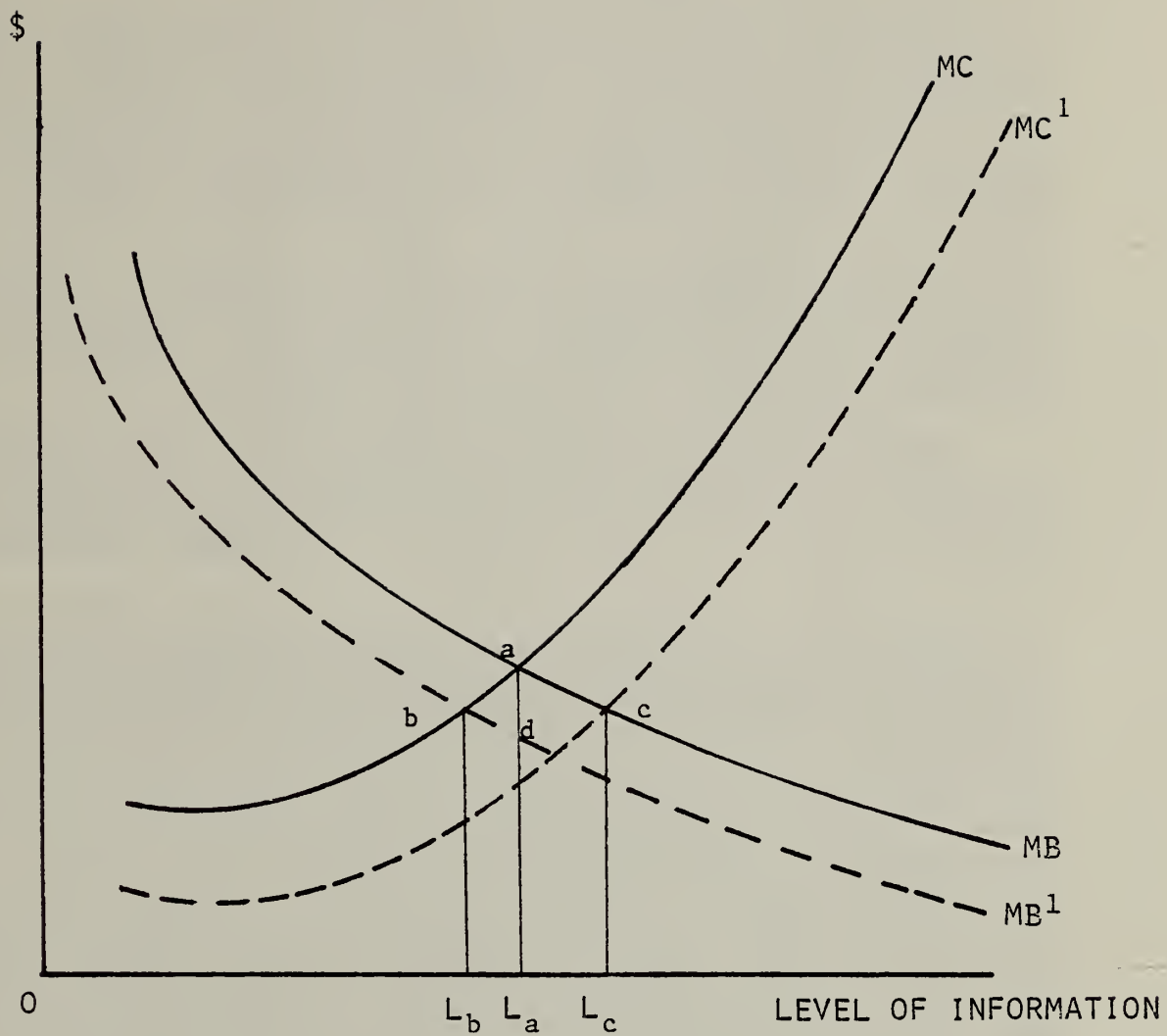


FIGURE 6. COST AND BENEFITS OF INFORMATION PROVISION

and public sectors may be involved in a particular program. Irrespective of which sector is involved, the marginal costs of information provision may be expected to increase as the level of information increases. Thus the costs of providing consumers with enough information to become technical experts in a particular area may be equivalent to the costs of training and educating technicians and professionals.

Marginal benefits include both the direct and indirect benefits from product information. Direct benefits include the increase in consumption efficiency, while indirect benefits include improvements in market efficiency and the ability of manufacturers and consumers to sell and buy products of different quality. Marginal benefits may be expected to decline as the level of information increases, again reflecting diminishing returns of information. While total benefits will increase with the level of information, they will increase at a decreasing rate.* The optimum level of information is given by point a in Figure 6. At this point the marginal costs of information provision are equal to the marginal benefits.

Mechanisms to achieve the desired level of consumer information include voluntary or mandatory information programs discussed in Sections 6.1 and 6.2. Three major considerations in the development of such programs are adequacy, efficiency, and feasibility.

The first consideration, program adequacy, is concerned with the degree to which the program can increase the level of consumer information. The program may be inadequate with respect to both the type of information and its availability. Too little information may bias the consumer by focusing attention on certain product characteristics to the exclusion of others. Comparable information for different products may also be unavailable. Advertising has frequently been cited for the above two inadequacies. Too much information, in turn, may result in information overload and limited use of information by consumers (16,31,40,45,46). Thus the attempt by the average consumer to use nutritional labeling to prepare the most nutritious meals for the lowest cost could easily result in information overload since the processing requirements are extensive. Experts are frequently responsible for the creation of information overload since they readily perceive the dangers of too little information. While the resulting program may be adequate with respect to content, high processing costs may mean that the information is never used, i.e., the marginal cost curve in

*The assumption of diminishing marginal benefits throughout is made for purposes of simplicity. Marginal benefits may increase initially as noted earlier with respect to Figure 5.

Figure 6 would intersect the marginal benefit curve to the left of the vertical axis.

Information should also be available when and where the consumer is likely to use it, as is the case with point-of-sale information. A considerable amount of consumer information literature is never used because it is provided in the wrong place at the wrong time. Unused information incurs a cost and is unlikely to generate many benefits for either the consumer or society as a whole. While some benefits may exist with respect to the consumer's perception of the marketplace and/or the competitive response of sellers, unused information will influence neither the consumer's efficiency frontier nor replace an inept buyers' market by an expert buyers' market.

As shown in Figure 6, unused information means that the realized marginal benefit curve (MB') differs from the anticipated marginal benefits (MB). Under such circumstances a level of information given by L_b is optimum. However, failure to recognize the divergence between actual and anticipated marginal benefits will result in mis-allocation of resources. The increase in the level of information from L_b to L_a entails an additional cost equal to $L_b b a L_a$ which exceeds the additional benefits given by $L_b b d L_a$.

While adequacy affects the marginal benefit curve, efficiency affects the marginal cost curve. The more efficient the information program, the lower the marginal cost curve and the greater the optimum level of information. Thus a shift in the marginal cost curve from MC to MC' will result in an increase in the optimum level of information from L_a to L_c . The marginal cost curve may change for several reasons, notably the generation and dissemination of information by the party or parties in the best position to do so. Thus, the consumer's own experience is an efficient mechanism for generating information concerning inexpensive, frequently purchased products. In other instances it is more efficient for information to be provided by organizations (either private or public) in view of the economies of scale in information collection and dissemination. Both operations need not be performed by the same organization. Thus, retailers are likely to be in the most favorable position for disseminating information in view of access to customers at the point of sale. However, they may not be the most efficient collectors of information.

Feasibility, the final consideration for developing consumer information program, is perhaps the most important since it determines both the program and the program sponsor. Feasibility does not pertain to program costs which have already been considered under the efficiency criterion and the necessity for equating program costs and benefits. Feasibility pertains to the ability to initiate and operate a particular program due to

seller or buyer response. For example, consumer interest in a voluntary program may be low, thus discouraging participation by manufacturers. Seller response to a voluntary program may also be negative due to several factors. There may be problems in selecting relevant product characteristics and in identifying suitable test methods. A second constraint is the impact of product information on the market power of established producers (6, 35). If firms perceive that the provision of product information is detrimental to their self-interests, then they are unlikely to participate.

Feasibility is closely related to the major issue in the provision of consumer information programs--the distribution of costs and benefits. While allocation of costs and benefits is not considered in cost-benefit analysis, such allocations may be important to the policy maker in securing support for a program, either voluntary or mandatory. Provision of information by either the private or public sector will incur costs which may be defrayed by non-recipients or non-beneficiaries of the information. For example, taxpayers may defray the cost of a specific product information program even though they do not use the product. Similarly, product information may not be used by all product purchasers, e.g., textile care labeling, nutritional labeling. The differential distribution of costs and benefits may create a problem in the area of consumer information. Proponents of such programs are generally the more affluent and better educated segments of society who are willing to pay for the information and are able to use it. Unless the information seekers are perceived as benefiting other consumers indirectly, i.e., through a more efficient market system, then information programs will be perceived as inequitable or unnecessary and may eventually be disbanded as the silent majority finds its voice. Communication of the importance of information in the efficient operation of the marketplace may be essential, therefore, in obtaining support for programs.

A more serious area of conflict is that between established producers and consumers. The indirect benefits from product information (more competitive markets and product quality control) may be detrimental to the interests of certain producers. The divergence between producer and consumer interests may be a major reason underlying the consumer information gap.

6.5.2 Conclusion

The existence of information failures in the marketplace is receiving increasing attention by various public and private organizations. It has been argued in defense of the existing information system that consumers already have all the information that they need and frequently more than they can use. However, this argument neglects the reasons for consumer failure

to use existing information. The fault may lie not with consumers but rather with the availability, content, and ease of use of the information supplied. The solution is not more of the same but a determination of the type of information which is needed. Since experience is the most adequate and efficient method for providing information for many consumer products, attention should be centered on those products where information is important to consumers, i.e., expensive, infrequently purchased products. Consideration should be given to the availability and adequacy of existing information in selecting products for information programs.

The continuation of the consumer information gap affects not only consumer welfare but the economy as a whole. Information is an essential element in the efficient performance of the free market system. Failure to provide adequate information threatens not only the performance of the system but also the system itself since intervention may occur to correct the deficiency, e.g., mandatory standards and certification. The divergence between consumer and producer interests is, in part, responsible for the perpetuation of the consumer information gap. While such a divergence may be expected to continue, the information gap may be reduced eventually as both parties recognize their mutual interest in the free market system.

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